

which has not hitherto been determined. Sars has observed that this ciliated disc is closely appressed to the wall of the cell, during the process of protrusion, and is in fact a kind of foot or creeping-organ, by means of which the polypide laboriously draws itself up towards the aperture of its tube. The Polyzoon, which, in its normal condition, is equipped with a powerful muscular apparatus, and remarkable for its vivacious habits, here literally crawls out of its cell.

5. It only remains to notice the dark-coloured cord, which runs throughout the creeping stem, and is a very marked feature of this curious form. It is described as a cylindrical tube, with firm, horny walls, inclosing a soft, transparent, cellular substance, from which branches are given off at intervals, and enter into the contractile cord of each polypide. This "axial cord" may no doubt be compared with the so-called nerve-trunk pervading the stem of other marine Polyzoa—the principal element of the supposed colonial nervous-system. Our author rightly regards the soft substance extending through the cord, as a sort of incompletely defined nervous trunk connecting all the individuals of the colony.

Of the development of *Rhabdopleura* little can be said at present. Both Sars and Allman, indeed, have recorded observations made on the formation of buds; but they disagree in their interpretation of several important points; and we must wait for further information before we can master this portion of the history.

From the foregoing account it is evident, as stated at first, that in *Rhabdopleura* we have the polyzoan structure in a very rudimentary condition, and half disguised by features that are alien to it as it now exists; some of its principal elements are fully established, though in a simpler form than we find them elsewhere; some are altogether wanting; while one important class of functions (the various movements of the polypide) is provided for by means which have no parallel whatever amongst other members of the tribe, and in part by an organ, which survives, reduced in size and with a different office, in one section only, as the so-called *epistome* of the fresh-water species.

Allman's examination of the Shetland *Rhabdopleura*, as preserved in spirits, led him to regard the Polyzoa as connected with the Mollusca, through the Lamellibranchiata, rather than the Brachiopods. Prof. Sars, relying on his son's investigations, takes a very different view of their affinities. He regards the *Rhabdopleura* as an organism "which stands as it were in the middle between the Hydrozoa and the Polyzoa," and forms a transition from one to the other. It is undoubtedly, he says, "like many other animals which at present inhabit the greater depths of the sea. . . a very old form, which in its organisation has still retained several features from the time when the animal type that we call Polyzoa first developed itself from a lower type." He considers it to prove that the Polyzoa "are most closely related to the type of the *Calenterates*, and especially to the class *Hydrozoa*," from which they are probably derived.

It is my present object merely to report results, and not to offer any criticism upon them; but it may safely be said that the paper, a portion of which I have summarised, is one of the most interesting and important contributions to biological literature, that have lately appeared.

It is right to add that the author, considering "one of the great universal languages" preferable to his mother-tongue, as the vehicle of scientific research; and as a graceful acknowledgment of the services rendered by our countrymen in recent times to zoological science, has courageously, and to the relief of many of his readers, written his memoir in English.

THOMAS HINCKS

NOTES

AT the Mid-summer Commencements, held last week in Trinity College, Dublin, the honorary degree of LL.D. was conferred by the University of Dublin on Dr. Andrews, of Belfast, and Professor Wright, of Cambridge.

DR. JAMES MURIE, Professor of Anatomy in the Edinburgh Veterinary College, has been elected to the newly-founded lectureship of Animal Physiology in the Edinburgh School of Arts.

ARCHÆOLOGISTS will be interested, and no doubt pleased, to hear, that Sir John Lubbock has just bought Silbury Hill, the grandest tumulus in Great Britain, if not in Europe.

WE have a number of earthquakes to chronicle this week; that in India, it will be noticed, preceded only by a day those of Italy. The earthquakes in Chili, on the 15th May, were of a very serious character. They affected Valparaiso, Santiago, Quillota, La Ligua, Canquenes, and Salvados. At Chillan, Concepcion, and Talchuano, in the south, so far as we can understand, it was slight. At Valparaiso, it commenced at 12.32 P.M., and lasted forty-two seconds, with a vertical motion, so that the ground danced under foot. Two churches and many buildings were damaged. Gas branches were wrenched from the ceilings, and books thrown from the shelves. In Salvados, in Central America, the earthquakes had ceased in May. At 2 P.M. on the 28th June, Asseerghur Fort was visited by an earthquake which lasted for about three or four seconds, direction from north-west to south-east. On the morning of June 29, about five o'clock, an earthquake visited several parts of Italy. At Verona, Treviso, and Venice, though the shocks were severe, little damage was done; but at Feletto, north of Piane, and near Conegliano, the church fell in and thirty-eight people are reported to have been killed. At Belluno four persons were killed and several wounded. At Pieve del Alpago several persons were injured. Two persons were killed at Torres, four at Curago, eleven at Puos, two at Visione, and one at Cavessago.

WE regret to hear that difficulties have arisen in the management of the Brighton Aquarium, which are likely to lead to the resignation of Mr. Saville Kent, who lately vacated a post in the British Museum for that of Curator and Resident Naturalist to the Aquarium. Of the nature of the dispute we are not informed, but it seems unfortunate if some means may not still be found by which an amicable arrangement may be arrived at between Mr. Kent and his colleagues by which his services may be retained to the institution.

THE female Octopus at the Brighton Aquarium still continues to guard her clusters of ova with the greatest vigilance, refreshing them at short intervals by turning upon them a powerful stream by means of her tubular funnel; no increase to the number deposited having taken place since last week, the usual complement produced may be presumed to have been excluded. The truncate "*Hectocotylus*" arm of the male, in this instance the third on the left side, is fast recovering its normal condition, a new slender filamentous process has sprung from the ruptured extremity, resembling, in detail, the reproduced arm of an *Ophiocoma* or Brittle Starfish. Mr. Saville Kent is of the opinion that the *Octopus tuberculatus* of D'Orbigny will prove on closer investigation to be the mate of *O. vulgaris*; the difference in appearance between individuals of the same species but the opposite sex being most marked when once recognised; the general surface of the integument in the female is comparatively smooth, while numerous rugosities and elevated papillæ adorn that of the male, more particularly in the neighbourhood of the head.

It has been announced by cable from America that a new planet (No. 132) was discovered by Prof. Henry on June 13.

THE just published lecture, delivered in April last by Prof. Flower at the Royal Institution, on "Palæontological Evidence of Gradual Modification of Animal Forms," is accompanied by an excellent and very ingeniously-constructed diagram of the affinities of the different members of the class Ungulata, including all the fossil as well as the recent forms. Each genus is represented by a circle, the comparative size of which indicates the number of species included in it. The existing genera are left white, and those which have fossil representatives are surrounded by rings, which are so shaded as to make it easy by referring to an accompanying table, to find in which stratum the form first appears; the extinct genera appear as shaded circles. Consequently the Peccary and Babirusa are represented by unsurrounded white circles, while *Coryphodon* and *Lophiodon* are all shaded; *Antelope* is a large white circle surrounded by a late Miocene ring; *Aceraterium* has a central late Miocene circle and an early Miocene ring, indicating its range in time. Such a method applied to all the classes of animals, if equally thorough and accurate, would be an invaluable acquisition to Zoological Science.

THE following telegram dated Alexandria, June 30, 1873, 1 P.M., has been received at the Foreign Office, from the Hon. H. C. Vivian, Her Majesty's Acting Agent and Consul-General in Egypt:—"Telegram just received from Sir Samuel Baker, dated Khartoum, yesterday, reports his safe arrival there in good health, with all the other Europeans. The country as far as Equator annexed to Egyptian dominion. All rebellions, intrigues, and slave trade completely put down. Country orderly. Government perfectly organised, and road open as far as Zanzibar. El Zaraf navigable. Victory on June 8 with only 105 men, over army of Onioso. This mission completely successful."

M. DE LESSEPS is a candidate for the place in the French Academy vacant by the death of the late M. de Verneuil.

THE name *Drepanophorus* having been recently used by Sir Philip Egerton for a species of fossil fishes, Mr. Sclater proposes to change the generic name which he gave to the Paradise Bird discovered by the Italian naturalist D'Albertis, to *Drepanornis*. We shall shortly have the opportunity of offering to our readers a description of this bird from the hand of Mr. Sclater, together with a drawing illustrating its peculiarities.

SOME years ago, in connection with the Berlin Geographical Society, an Association, joined in by all the chief European powers except France and England, was formed for the purpose of determining a standard European metre, to be based on the exact determination of the meridian between Christiana and Palermo. The work has developed itself into the ascertainment of the dimensions of the globe, and the Association has been now joined by France, England thus being the only power which holds itself aloof from taking part in the highly valuable work. The result will be the union of the triangulation of the whole of Europe.

AT the recent D.Sc. examination of the University of London Mr. Richard Wormell, M.A., passed in Electricity, and Mr. Augustus C. Maybury in Geology.

ATTENTION has been lately given by the American Ethnologists to the fossil skeleton of Guadeloupe, and they support the suggestion that it belongs to the Carib race. This admission still allows of considerable antiquity.

DOCTOR Don Ricardo de la Parra, died at Envijado, in Antioquia, U.S. of Colombia, on May 9. He was about to publish a work on Elephantiasis, which had been a special study,

THE volcano of Puraca, in the western state of Cauca, in the U.S. of Colombia, has been in convulsion for three years, and is now causing great alarm. It gives rise to frequent storms.

THE forthcoming number of Petermann's *Mittheilungen* will contain a very interesting article by Carl Dambeck on the Geographical Distribution of Sea-fish, in which the author divides the ocean into eleven regions, and gives lists of the principal fishes to be found in each region.

MR. LAMONT's fine yacht *Diana*, which was chartered by Mr. Leigh Smith, and which recently left Dundee on a Polar Expedition, is reported by the whaler *Edipse*, which arrived at Peterhead on Sunday. The letters which have been received announce that the party were on June 1 last in latitude 77°40', being among the floating ice, which reached northward to Spitzbergen. At that time all connected with the expedition were well, and notwithstanding that very severe weather had prevailed since leaving Scotland, no accident had happened. The arrangements had been slightly interfered with in consequence of the tempestuous weather, and the island of Jan Mayen had not been reached. The *Diana* was to proceed along the outside of the ice towards the north-west corner of Spitzbergen, where she will meet a storeship which preceded her.

MUCH gratification is felt in Peru at the discovery of a new coal deposit near Pisco, which is said to be one of the best and richest on the Pacific coast, and the locomotives on the Ica and Pisco Railway are using it with great success. The mine is situated close to the sea, and near a perfectly safe harbour, and the coal is said to be finer in quality than any in Chili, and of great extent, and, if so, must prove to be of very great economical value.

A GENERAL meeting of the members of the Aeronautical Society of Great Britain was held on Monday evening in the theatre of the Society of Arts, under the presidency of Mr. Glaisher. A number of models prepared for the occasion were exhibited by persons actively interested in the advancement of the great scheme of aerial navigation. The chairman, in his opening remarks, expressed his satisfaction at having to record several marks of progress made during the past year in the science in which they were all so interested. These marks were certainly slight, but they were nevertheless decided steps in the right direction. Very many experiments of the highest importance to the furtherance of aerial navigation had been carried out in many cases with what might be considered tolerably satisfactory results. The Society had, he added, expended a sum of 1,200*l.* in the construction of a balloon the motive power of which was to be brought about by a small steam engine, now in preparation, of a merely nominal weight, and giving, for its size, an exceedingly high pressure of steam. A model of this was exhibited in operation by Messrs. Thomas Moy and R. E. Shill. Papers were read during the evening by several gentlemen, including Mr. Bennett and Mr. D. S. Brown.

THE French "Society of the Friends of Science," an association for succouring the widows and orphans of men of science, has distributed during the last three years, in spite of the misfortunes of the country, 88,439 fr.

THE scarcity of rags has, it is well known, recently induced paper manufacturers to look out for new textures as substitutes for those formerly used. In France hop-stalks have been successfully utilised for this purpose, and in this country an attempt has been made to utilise jute for newspapers. A copy of the *Warrington Guardian*, printed on jute paper, has been sent us, and it appears to us quite satisfactory.

A SOCIETY for the Promotion of Scientific Industry has recently been established in Manchester. Its object is the increase of the

technical knowledge and skill of those engaged in the various industries, the improvement and advancement of manufactures and the industrial arts and sciences, and the general progress, extension, and well-being of industry and trade. The society is sending out artisans to Vienna to profit by the Exhibition now being held there, as was done by the Society of Arts on the occasion of the Paris Exhibition, and it proposes to hold in the autumn an exhibition of designs in textile fabrics and of fuel economisers.

A PAPER entitled "Contributions to a Knowledge of North American Moths," by Aug. R. Grote, was read on June 6 before the Buffalo (U.S.) Society of Natural Sciences, in which it was stated that three new genera (*Litognatha*, *Meghypena*, *Phæcasiophora*), and nineteen hitherto undescribed species (*Acronycta*, 4; *Agrotis*, 1; *Cloantha*, 2; *Litognatha*, 2; *Meghypena*, 2; *Botis*, 1; *Phæcasiophora*, 1; *Eurycreon*, 1; *Peuthina*, 3; *Grapholitha*, 1; *Oeta*, 1) occur in the North American insect fauna. At the same time a paper entitled "Descriptions of New Species of Fungi," by Chas. H. Peck, was read, in which it was stated that 142 hitherto undescribed species of fungi (*Hymenomyces*, 96; *Gasteromycetes*, 11; *Coniomycetes*, 18; *Hyphomycetes*, 6; *Ascomycetes*, 11) occur in the flora of the United States.

IN connection with the Social Science Congress, to be held at Norwich, from the 1st to the 8th of October next, there will be an Exhibition of Educational, Sanitary, and Domestic Appliances, based on the experiment which proved so successful at Leeds in 1871. The object of the exhibition is to bring under the notice of the public generally, and particularly those who are interested in social, sanitary, and educational questions, the latest scientific appliances for improving the public health and promoting education. The exhibition will be open to exhibitors from all parts, and the management will be under the superintendence of a committee.

A VALUABLE paper in the May number of the *Canadian Journal* is a contribution to a Fauna Canadensis, by Prof. H. Alleyne Nicholson, being an account of the animals dredged in Lake Ontario in 1872. The dredgings were all carried on within a radius of ten miles from Toronto, and Prof. Nicholson describes the nature of the bottom, and forty-three species of animals taken up in the dredge, belonging to Annelida, Crustacea, Arachnida, Insecta, Mollusca, and Vertebrata. The paper possesses several points of interest.

WE have received Nos. 3 and 4 of the *School Laboratory of Physical Science*, a small quarterly journal edited by Prof. Hinrichs, Director of the Laboratory of the Iowa State University. The longest paper is entitled "Science in Schools," and gives a comparative view of the place occupied by Physical Science in the Classical Courses of the American Colleges, the palm in this respect being given to Harvard. Prof. Hinrichs thinks, notwithstanding the comparatively great importance attached to physical science in America, the place allotted to it in her universities is still far from satisfactory. Under the head of "Laboratory Notes," Prof. Hinrichs gives a method of determining the Velocity of Sound in the Atmosphere.

MR. T. LOGIN, C.E., Superintending Engineer, 2nd Circle, Punjab, has sent us a small pamphlet, entitled "Practical Notes on the Egyptian Mode of Cotton Cultivation," containing a series of well-arranged directions on this subject, founded on Mr. Login's own experiments, which appear to have been unusually successful.

WE have received from Messrs. Asher and Co., Nos. 378, 379, 380, of Kirchhoff and Wigand's (of Leipzig) "Antiquarisches Bücherlager," containing long lists of very valuable works in Mathematical, Physical, and Mechanical Sciences.

ACCORDING to the *American Artisan*, the new educational system in Japan embraces the organisation of 8 colleges, 256 high schools, and over 50,000 public schools, at which the attendance is to be compulsory for all children above six years of age.

A SUPPLEMENT to the Fifth Annual Report of the United States Geological Survey of 1871, contains an enumeration with descriptions by Mr. Leo Lesquereux, of some tertiary fossil plants, from specimens procured in the explorations of Dr. F. V. Hayden, in 1870. Another small pamphlet connected with the same survey contains carefully compiled and very valuable lists of elevations and distances in that portion of the United States west of the Mississippi, collated and arranged by Prof. C. Thomas.

THE "Report of the Entomological Society of Ontario," for 1872, contains papers on Insects injurious to the Grape, the Strawberry, the Hop, the Maple, the Peach, the Potato, on some innocuous insects, and on beneficial insects.

WE have received the "Report of Progress" of the Geological Survey of Canada for 1871-72, containing detailed and well-compiled accounts from the various parties who are carrying on the work.

WE learn that there has been erected a small observatory on the Columbia (U.S.) College campus for educational and, we hope, also for scientific purposes. The observatory is furnished with an equatorial, accompanied by a seven-prism spectroscope, by Clark, and a position micrometer, besides an altazimuth and a zenith telescope.

WE take the following from a paragraph entitled "Prof. Agassiz on Natural History in Schools," in the *University Monthly* (New York):—"I am satisfied that there are branches of knowledge which are better taught without books than with them; and there are some cases so obvious, that I wonder why it is that teachers always resort to books when they would teach some new branch in their schools. When we would study natural history, instead of books let us take specimens—stones, minerals, crystals. When we would study plants, let us go to the plants themselves, and not to books describing them. When we would study animals, let us observe animals."

ADDITIONS to the Brighton Aquarium during the past week; 2 Bass (*Labrax lupus*); 14 Black Bream (*Cantharus lineatus*); 1 Ballan Wrasse (*Labrus maculatus*); 1 three-bearded Rockling (*Motella vulgaris*); 6 Sea Crayfish (*Palinurus vulgaris*); 1 Toad Crab (*Dromia vulgaris*); 1 Octopus (*Octopus vulgaris*), presented by Mr. C. J. Small, of Hastings; 1 Sea-hare (*Aplysia punctata*); Oysters (*Ostrea edulis*); Mussels (*Mytilus edulis*); Zoophytes (*Tealia crassicornis*, *Alcyonium digitatum*).

THE additions to the Zoological Society's Gardens, during the last week, include an Erxleben's Monkey (*Cercopithecus erxlebeni*); a Moustache Monkey (*C. rephus*); a banded Ichneumon (*Herpestes fasciatus*) and two bronze Spotted Doves (*Chalcopelia chalcospilos*), from West Africa, presented by Mr. J. J. Monteiro; a greater Sulphur Crested Cockatoo (*Cacatua galerita*), from Australia, presented by Mrs. Thomas; a Hyacinth Porphyrio (*Porphyrio hyacinthinus*), from West Africa, presented by Lady Cust; a grey Ichneumon (*Herpestes griseus*), from India, presented by Mr. W. Walker; an Argus Pheasant (*Argus giganteus*), from Malacca; two Rufous-tailed Pheasants (*Cerionis erythrophthalmus*), from India; a white-handed Gibbon (*Hylobates lar*), from the Malay Peninsula; a Puma (*Felis concolor*), from Bogota; two Lanner Falcons (*Falco lanarius*), from E. Europe, deposited.